WHAT IS CLAIMED IS:

1. A semiconductor laser comprising: a semiconductor substrate; a core region formed on one side of the semiconductor substrate; and a clad region formed on the opposite side of the substrate not having the core region;

wherein the core region has a gain area length not smaller than 18 micrometers and not greater than 200 micrometers; at least one of the core region and the clad region has a stripe shape and a stripe width is modulated in the vertical direction against the optical axis of at least the core region or the clad region and in the parallel direction with respect to the substrate surface;

the stripe width in the vicinity of the stripe ends is set narrower than a cut-off width where a lateral mode is identical; and the lateral width in the horizontal direction has a portion within the gain region set wider than the cut-off width where the lateral mode is identical.

2. The semiconductor laser as claimed in Claim 1, wherein the portion within the gain region set wider than the cut-off width where the lateral mode is identical is a multi-lateral-mode waveguide.

3. The semiconductor laser as claimed in Claim 1, wherein the multi-lateral mode waveguide has a lateral width and length decided so as to minimize a conversion loss accompanying mode conversion at the

junction between a waveguide mode of the multi-lateral mode waveguide and a waveguide mode of a lateral-mono mode waveguide.

4. The semiconductor laser as claimed in Claim 1, wherein the lateral width W and the waveguide length L of the multi-lateral mode waveguide, effective refractive index n of the laser waveguide, and an operation wavelength $\lambda$ are decided so as to satisfy a formula as follows:

$$0.9\ nW^2/l \leqq L \leqq 1.1\ nW^2/l$$

5. The semiconductor laser as claimed in Claim 1, wherein the multi-lateral mode waveguide has a lateral width W in a range from 3 to 10 micrometers.

6. The semiconductor laser as claimed in Claim 1, further comprising a reflection mirror formed by etching the clad region and the core region.

7. The distribution return type semiconductor laser as claimed in Claim 1, wherein a diffraction grating is formed in the lateral-mono mode waveguide portion and a Bragg reflector is formed.

8. The distribution reflection type semiconductor laser as claimed in Claim 1, wherein a diffraction grating is formed in the lateral-mono mode waveguide portion and a Bragg reflector is formed.

9. The wavelength changeable semiconductor laser as claimed in Claim 7, wherein the Bragg reflector has a reflection wavelength changed by an external signal so as to artificially change the oscillation wave-

length.

10. An optical module comprising at least an optical fiber for introducing light outside and the semiconductor laser as claimed in Claim 1.

11. A semiconductor laser comprising: a semiconductor substrate; a core region formed on one side of the semiconductor substrate; and a clad region formed at least on the opposite side of the substrate not having the core region;

wherein the core region has a gain area length not smaller than 5 micrometers and not greater than 200 micrometers; at least one of the core region and the clad region has a stripe shape and a stripe width is modulated in the vertical direction against the optical axis of at least the core region or the clad region and in the parallel direction with respect to the substrate surface;

the stripe width in the vicinity of one of the stripe ends is set narrower than a cut-off width where a lateral mode is identical; and the lateral width in the horizontal direction has a portion within the gain region set wider than the cut-off width where the lateral mode is identical.

12. The semiconductor laser as claimed in Claim 11, wherein the portion within the gain region set wider than the cut-off width where the lateral mode is identical is a multi-lateral-mode waveguide.

13. The semiconductor laser as claimed in Claim

11, wherein the multi-lateral mode waveguide has a lateral width and length decided so as to minimize a conversion loss accompanying mode conversion at the junction between a waveguide mode of the multi-lateral mode waveguide and a waveguide mode of a lateral-mono mode waveguide.

14. The semiconductor laser as claimed in Claim 11, wherein the lateral width W and the waveguide length L of the multi-lateral mode waveguide, effective refractive index n of the laser waveguide, and an operation wavelength $\lambda$ are decided so as to satisfy a formula as follows:

$$0.9\ nW^2/l \leqq L \leqq 1.1\ nW^2/l$$

15. The semiconductor laser as claimed in Claim 11, wherein the multi-lateral mode waveguide has a lateral width W in a range from 3 to 10 micrometers.

16. The semiconductor laser as claimed in Claim 11, further comprising a reflection mirror formed by etching the clad region and the core region.

17. The distribution return type semiconductor laser as claimed in Claim 11, wherein a diffraction grating is formed in the lateral-mono mode waveguide portion and a Bragg reflector is formed.

18. The distribution reflection type semiconductor laser as claimed in Claim 11, wherein a diffraction grating is formed in the lateral-mono mode waveguide portion and a Bragg reflector is formed.

19. The wavelength changeable semiconductor laser

as claimed in Claim 17, wherein the Bragg reflector has a reflection wavelength changed by an external signal so as to artificially change the oscillation wavelength.

20. An optical module comprising at least an optical fiber for introducing light outside and the semiconductor laser as claimed in Claim 11.